CLAIMS

1. A one-port surface acoustic wave resonator comprising a rotated Y-cut $LiTaO_3$ substrate, an interdigital electrode transducer on the $LiTaO_3$ substrate, and reflectors at both sides in the surface acoustic wave propagation direction of the interdigital electrode transducer, wherein

when the electrode finger width of the interdigital electrode transducer is denoted by a and the gap between the electrode fingers is denoted by b, the metallization ratio, a/(a + b), is in the range of 0.55 to 0.85 and the interdigital electrode transducer is assigned with overlapping-length weight.

2. The one-port surface acoustic wave resonator according to claim 1 or 2, wherein the cut angle of the $LiTaO_3$ substrate is in the range of 36° to 60°.

3. A one-port surface acoustic wave resonator comprising a rotated Y-cut $LiTaO_3$ substrate, an interdigital electrode transducer on the $LiTaO_3$ substrate, and reflectors at both sides in the surface acoustic wave propagation direction of the interdigital electrode transducer, wherein

the metallization ratio, a/(a + b), is in the range of 0.45 to 0.85 when the electrode finger width of the interdigital electrode transducer is denoted by a and the gap between the electrode fingers is denoted by b, the interdigital electrode transducer is assigned with overlapping-length weight, and the cut angle of the $LiTaO_3$ substrate is in the range of 40° to 60°.

4. The one-port surface acoustic wave resonator according to any one of claims 1 to 3, wherein the amount of the overlapping-length weight is 87.5% or less.

5. The one-port surface acoustic wave resonator according to any one of claims 1 to 4, wherein the film thickness of the interdigital electrode transducer is controlled so that the mass is equivalent to

that of an aluminum electrode having a film thickness of 8 to 14% of the wavelength of the surface acoustic wave.

6. The one-port surface acoustic wave resonator according to claim 5, wherein the film thickness of the interdigital electrode transducer is controlled so that the mass is equivalent to that of a copper electrode having a film thickness of 2.4 to 4.2% of the wavelength of the surface acoustic wave.

7. The one-port surface acoustic wave resonator according to claim 6, wherein the film thickness of the interdigital electrode transducer is controlled so that the mass is equivalent to that of a gold electrode having a film thickness of 1.1 to 2.0% of the wavelength of the surface acoustic wave.

8. A surface acoustic wave filter including the one-port surface acoustic wave resonator according to any one of claims 1 to 7.

9. The surface acoustic wave filter according to claim 8, wherein the surface acoustic wave filter is a ladder-type surface acoustic wave filter, a lattice-type surface acoustic wave filter, or a surface acoustic wave filter provided with the one-port surface acoustic wave resonator as a trap.